

• 223. M. Biot does not appear to admit the successive decompositions and recompositions spoken of by Grotthuss, Davy, etc., etc.; but seems to consider the substance whilst in transit as combined with, or rather attached to, the electricity for the time,¹ and though it communicates this electricity to the surrounding undecomposed matter with which it is in contact, yet it retains during the transit a little superiority with respect to that kind which it first received from the pole, and is, by virtue of that difference, carried forward through the fluid to the opposite pole.²

224. This theory implies that decomposition takes place at both poles upon distinct portions of fluid, and not at all in the intervening parts. The latter serve merely as imperfect conductors, which, assuming an electric state, urge particles electrified more highly at the poles through them in opposite directions, by virtue of a series of ordinary electrical attractions and repulsions.³

225. M. A. de la Rive investigated this subject particularly, and published a paper on it in 1825.⁴ He thinks those who have referred the phenomena to the attractive powers of the poles, rather express the general fact than give any explication of it. He considers the results as due to an actual combination of the elements, or rather of half of them, with the electricities passing from the poles in consequence of a kind of play of affinities between the matter and electricity.⁵ The current from the positive pole combining with the hydrogen, or the bases it finds there, leaves the oxygen and acids at liberty, but carries the substances it is united with across to the negative pole, where, because of the peculiar character of the metal as a conductor,⁶ it is separated from them, entering the metal and leaving the hydrogen or bases upon its surface. In the same manner the electricity from the negative pole sets the hydrogen and bases which it finds there, free, but combines with the oxygen and acids, carries them across to the positive pole, and there deposits them.⁷ In this respect M. de la Rive's hypothesis accords in part with that of MM. Riffault and Chompre (221).

226. M. de la Rive considers the portions of

matter which
are decomposed to be those contiguous to *both*
poles.⁸ He

¹ *Precis Elementaire de Physique*, sme Edition, 1824,
torn. i. p. 636.

² *Ibid.* p. 642. ³ *Ibid.* pp. 638, 642.

⁴ *Annales de Chimie*, torn, xxviii. p. 190. ⁵ *Ibid.* pp. 200,
202.

⁶ *Ibid.* p. 202. ⁷ *Ibid.* p. 201. ⁸ *Ibid.* pp. 197,
198.